MISSOURI DEPARTMENT
OF NATURAL RESOURCES

WELCOME AND INTRODUCTION

Volunteer Water Quality Monitoring

Part of The Missouri Stream Team Program

CFM

MDC

DNR

And

CITIZENS!

GOALS

- Inform and Educate
- Establish a Monitoring Network

Stream Classification

- Bodies that maintain water during low flow periods in dry weather and have official, identifiable beneficial uses.

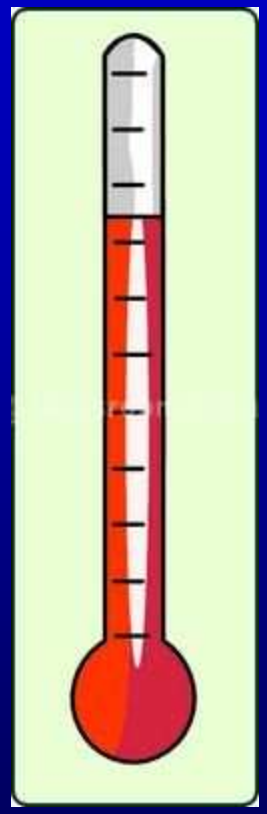
- Designated/Beneficial Uses – assigned by MO Clean Water laws (partial list)
  - Whole body contact (i.e., swimming)
  - Secondary contact (i.e., fishing, boating, etc.)
  - Drinking Water – Humans, wildlife/livestock
  - Industrial
  - Warmwater/Coldwater Fisheries
  - Irrigation

303(d) Listed Streams

- List of **segments** of streams that do not meet one or more of their designated uses
- Can find this list on DNR's website www.dnr.mo.gov
- EPA requires an updated list every two years

Water Temperature

- Has an enormous effect on water quality
- Organisms are dependent on certain temperature ranges in order to absorb oxygen in the water
- Can be a reason for a stream segment not meeting its designated/beneficial use



Water Temperature

- Causes of Temperature Change Include:
  - Weather
  - The removal of riparian vegetation
  - Impoundments (a body of water confined by a barrier like a dam)
  - Discharge of cooling water
  - Urban storm water
  - Groundwater inflows to the stream

Table 3. Major Water Pollution Sources In Missouri Classified Waters.
(Stream Miles or Lake Acres Impaired)

Source	Stream Miles Impaired	Percent of Total Miles	Lake Acres Impaired	Percent of Total Acres
Unknown	724.6	3	--	--
Mining	171.6	1	--	--
Tailings	105.7	*	--	--
Other Mining Activities	65.9	*	--	--
Atmospheric Deposition	2.5	*	18,610	6
Municipal and other Domestic Point Sources	82.3	*	--	--
Urban Runoff and Construction	61.3	*	18	*
Agriculture	19.5	*	29	*
Crop Production	2.0	*	29	*
Hydromodification	15.0	*	865	*
Flow Regulation/Modific.	1.0	*	--	--
Streambank Mod./Destab.	14.0	*	--	--
Upstream Impoundment	--	--	865	*
Natural Sources	8.0	*	--	--
Industrial Point Sources	7.3	*	--	--
Recreational Activities	6.0	*	--	--

* Less than 1 percent

Source: Missouri Water Quality Report, 2006

WADEABLE STREAMS ASSESSMENT

http://www.epa.gov/owow/streamsurvey/index.html

- Sampled macroinvertebrate communities to determine biological condition of 1,392 wadeable streams (671,000 miles of 1st-5th order streams and rivers) nationwide

- 42% in poor biological condition
- 25% in fair biological condition
- 28% in good biological condition

***Source: US EPA 2004**

Wadeable Streams Assessment

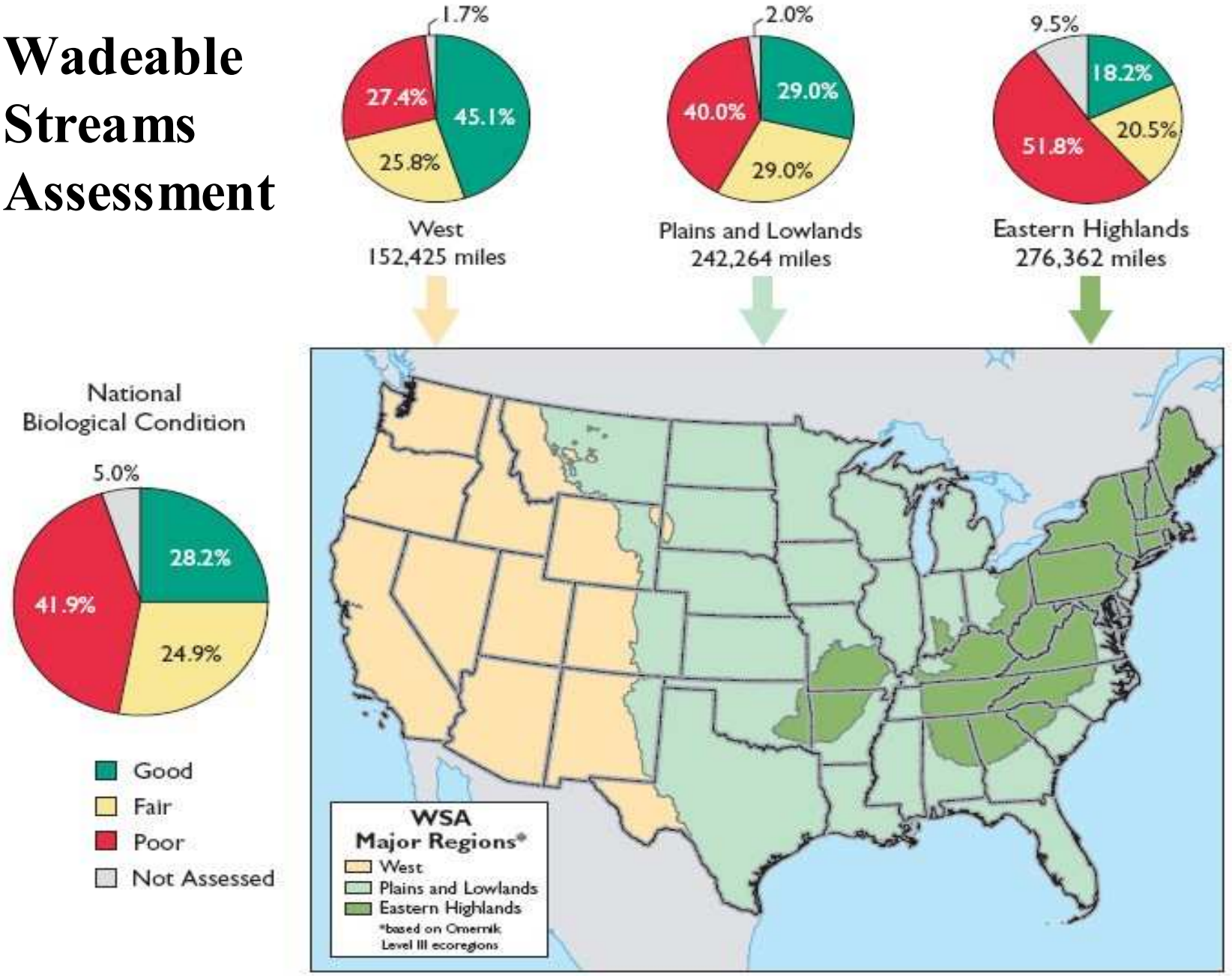
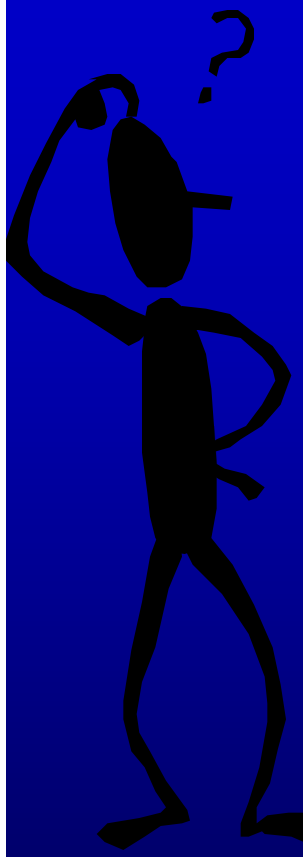


Figure ES-1. Biological condition of wadeable streams (U.S. EPA/WSA).

GOALS

- Inform and Educate
- Establish a Monitoring Network
- Enable Citizens
- Halt Degradation



Open To Anyone Who is Interested In Water Quality

INTRODUCTORY LEVEL

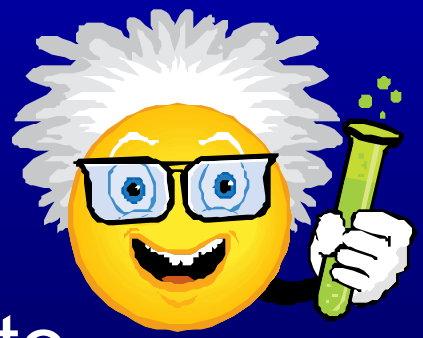
- This is the entry level of monitoring that includes watershed mapping, site selection, stream discharge, and biological monitoring.
- The emphasis is education about watersheds and biological monitoring.
- Classes offered in spring and early summer.

LEVEL 1

- This level includes chemical and physical monitoring.
- A quality control designation of Level 1 indicates that the volunteer has completed the 8-hour Level 1 workshop.
- Classes offered in late summer/early fall.

LEVEL 1 (cont.)

- To be eligible, must have attended Intro class AND submitted Site Selection, Water Temperature, Stream Discharge and Macroinvertebrate data.



- Class in which you are qualified to receive chemical monitoring equipment.

LEVEL 2

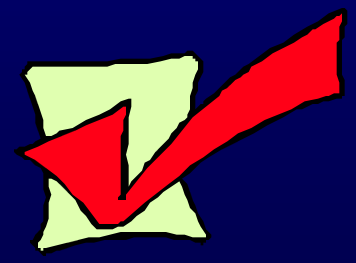
- Data assigned the quality control designation of Level 2 indicates the volunteer has successfully completed the Level 2 Quality Assurance/Quality Control (QA/QC) workshop.

- To be eligible, must have attended Level 1 class AND submitted Visual Survey and Water Chemistry data.

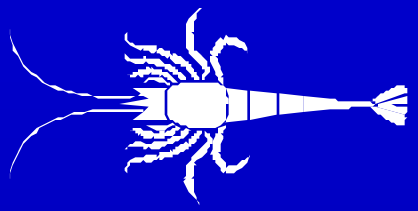
LEVEL 2 (cont.)

A Level 2 Workshop allows the volunteer to:

- Check their chemical monitoring equipment to ensure that it is functioning properly.
- Improve their chemical monitoring techniques.
- Improve their ability to identify macroinvertebrates.
- Get assistance identifying unknown invertebrates from their streams.
- Confirm identification of invertebrates in their reference collection.



LEVEL 3



- The designation of Level 3 indicates that program personnel have evaluated the volunteer in the field at their monitoring site.

- To be eligible, a volunteer must successfully complete the Level 2 Workshop AND regularly submit Chemical, Invertebrate, Stream Discharge, and Visual Survey data.

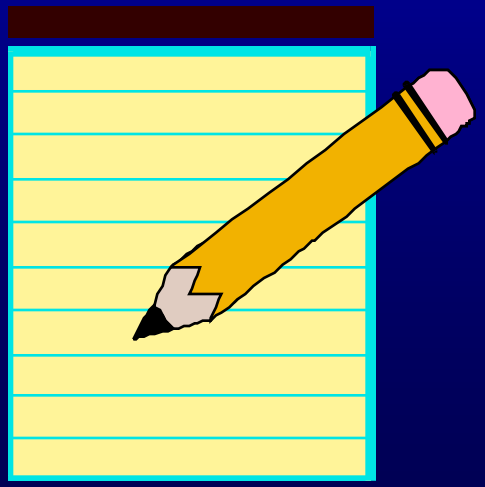
LEVEL 3 (cont.)

To successfully complete Level 3, the volunteer must:

- Meet accuracy limits on 5 out of 5 chemical parameters.
- Correctly identify 90% of the invertebrates at their site to the appropriate taxonomic level.
- Correctly identify 100% of the mayflies, stoneflies, and caddisflies at their site to Order.

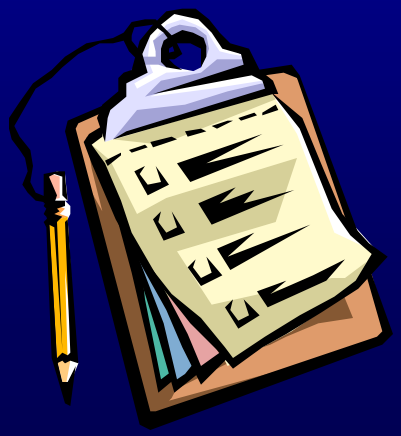
TODAY'S WORKSHOP

- Information & Training
- Equipment
- Site Selection
- Networking



EXPECTATIONS FROM VOLUNTEERS

- Share knowledge & information
- Periodically monitor a stream
- Submit data



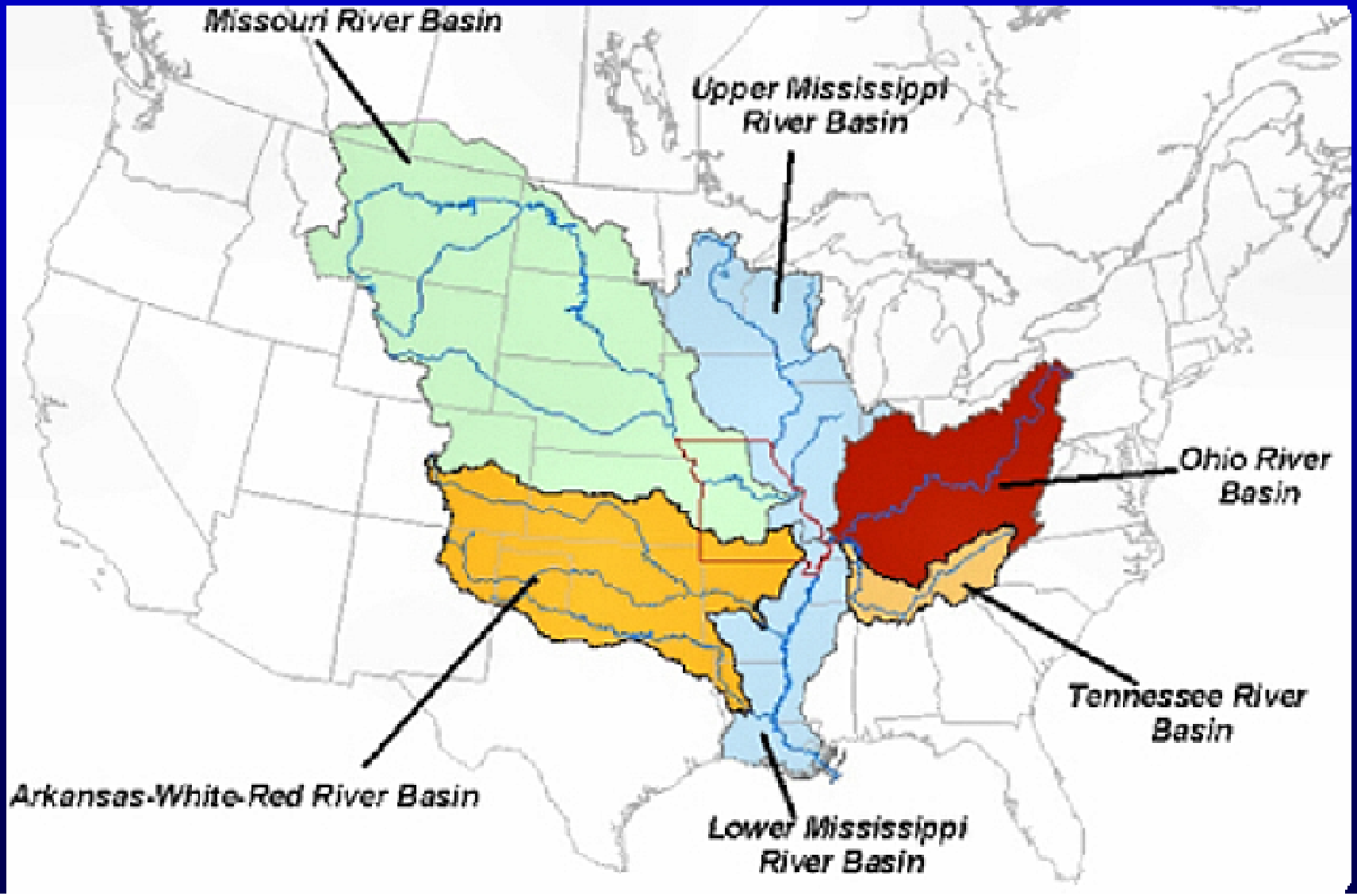
DATA USES

- Inform and Educate
- Gather Baseline Information
- Locate Problems
- Identify Long-term Trends
- Supplement Agency Data

USES OF LEVEL 2 & 3 DATA

- Evaluate Best Management Land Use Practices (BMPs)
- Planning by Local Agencies, Such as Zoning Regulations
- Planning and Permitting - DNR
- DNR's Biennial Report to EPA (305(b))

The Quality of a Stream is a Reflection of its WATERSHED



THE WATER QUALITY OF A STREAM IS A COMBINATION OF:

- PHYSICAL
- CHEMICAL
- BIOLOGICAL

Characteristics

PHYSICAL PARAMETERS

- Watershed
- Floodplain
- Riparian Corridor
- Streambanks
- Stream Channel
- Streambed

CHEMICAL PARAMETERS

- Dissolved Oxygen
- pH
- Nitrates and Phosphates
- Conductivity
- Temperature
- Turbidity

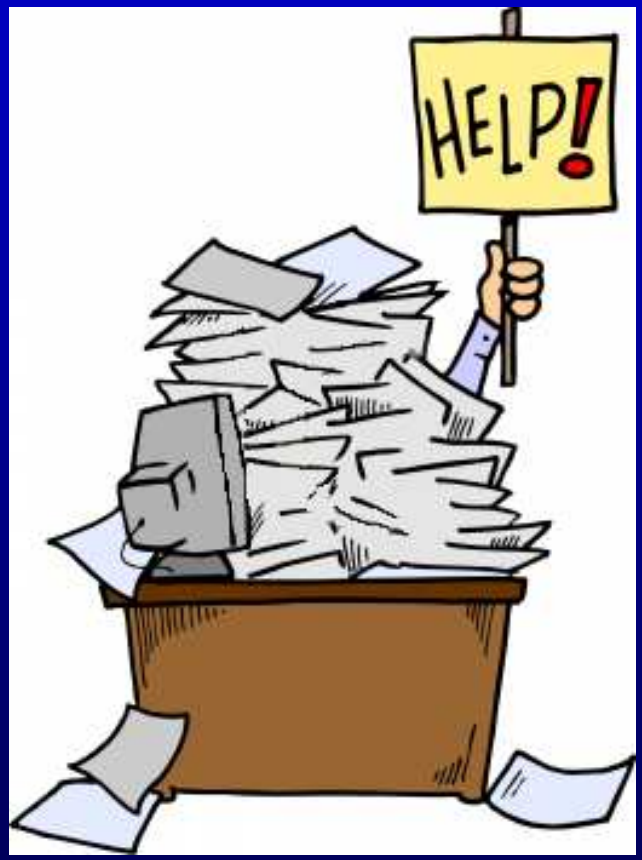
BIOLOGICAL MONITORING

- The Organisms Living in a Stream Reflect the Health of the Stream
- Many Species with Different Tolerances
- Look for the Presence or Absence of Sensitive Organisms



Workshop Paperwork

- Activity Report
- Training Record/Letter of Agreement
- Course Evaluation
- Liability Waiver



ACTIVITY PRIZE DRAWING

Activity Prize items will change every three months.

If you would like to be included in our "Activity Prize Drawing," please check box at right and **attach a list of participant names**. Please print clearly. The more activities you submit, the better your chances! New prizes will be drawn every three months. ☐ Activity Prize

or

Attention teachers and youth group leaders: For a youth group prize, please check the box at right, but you do not need to include a participant list for group prizes. New prizes will be available and drawn every three months. ☐ Youth group prize

THANK YOU ITEMS

You may request these free items in any combination.

ITEM:	Number requested:
Stream Team T-Shirt (Adult sizes only)	S___ M_1_ L___ XL___ XXL___
Stream Team Colorbook (Superstars, Grades K-3)	
Stream Team Colorbook (Most Wanted, Grades 4-6)	
Bumper Sticker (Quality Water, 3 1/2" x 9 1/4")	1
Pencil (Get Into Missouri Streams, blue sparkle)	
Stream Team Scratch Pad (5 1/2" x 8 1/2")	
Post-it Notes (MO Stream Team)	
Sticker (Get Into Missouri Streams, 3" round)	
Temporary Tattoos (Get Into Missouri Streams)	
Bandannas (Stream Team)	
Stream Team Patch (Embroidered, 3" round)	
Stream Team Mini-Buttons (1 1/4" pins)	1
Stream Team Keychains	
Stream Team Can Koozies	1

Please allow up to three weeks for delivery. Thanks!

ACTIVITY SUPPLIES

These free supplies are available for your activities.

ITEM:	Number requested:
Work Gloves (Specify youth or adult size)	
Litter Pickup Bag (standard red mesh)	10
Litter Pickup Bag (24" x 36" mesh) for cleanups with larger trash)	
First Aid Kit	1

Missouri Stream Team Activity Report

This report can be turned in after only 1 activity.
Stay active -- you make a difference for Missouri streams!

Stream Team Identification:

Please help us save on shipping costs; ship to your office or school if possible!

Team Number: 1639

Team Name: WQM Coordinators

Reporter Name: Amy Jungclaus

Business/School: (if applicable) MDC

Please check one: Commercial ☑ Residential ☐

Shipping Address: (no PO Box please) 2901 W. Truman Blvd

City, State, Zip: Jefferson City, MO 65109

Home Phone: (913)708-3427 Work Phone: (573)522-4115

Updated E-mail: AmyJungclaus@mdc.mo.gov

Contact Person for Team: Chris Riggert

Is there a change in Contact Person? Yes (No)
Is there a change in Contact Person address? Yes (No)

If yes, new address:

Please provide details about your activities on the reverse side.

Mail this Activity Report to:
MISSOURI STREAM TEAM
PO BOX 180
JEFFERSON CITY MO 65102-0180

We welcome your activity photos. Be aware they may be published in our newsletter or annual report. Thank you!

For more information, contact us at:
Phone: 1-800-781-1989 (voice mail)
E-mail: streamteam@mdc.mo.gov
Website: www.mostreamteam.org
Fax: 573/526-0990

1/15/2009

Stream Team Activity Report

Stream Team Activity 1

Type of activity: (see code list at right) WKS

Activity date: 3/27/2009

Stream name:

Activity county: St. Charles

Activity basin:

Miles of river covered:

Number of volunteers involved: 1

Hours spent on project: 8

Measurement : Please list number of monitoring trips, bags of trash collected, letters written, trees planted, events held, etc. See code list at right.

1

Location Description: Please provide a detailed location for your activity. (Example: 100 yds. upstream from Hwy. 63 bridge.) Include township, range, and section if possible. A good source for maps can be found at www.digital-topo-maps.com.

Project Description: Please include as much information as you can about your activity. Include facts about the project not covered above. (Example: "Held 4th Annual litter pickup and picnic at Dry Fork Creek.")

Volunteer Water Quality Monitoring Introductory Workshop

Stream Team Activity 2

Type of activity: (see code list at right)

Activity date:

Stream name:

Activity county:

Activity basin:

Miles of river covered:

Number of volunteers involved:

Hours spent on project:

Measurement : Please list number of monitoring trips, bags of trash collected, letters written, trees planted, events held, etc. See code list at right.

Location Description: Please provide a detailed location for your activity. (Example: 100 yds. upstream from Hwy. 63 bridge.) Include township, range, and section if possible. A good source for maps can be found at www.digital-topo-maps.com.

Project Description: Please include as much information as you can about your activity. Include facts about the project not covered above. (Example: "Held 4th Annual litter pickup and picnic at Dry Fork Creek.")

Stream Team Activity 3

Type of activity: (see code list at right)

Activity date:

Stream name:

Activity county:

Activity basin:

Miles of river covered:

Number of volunteers involved:

Hours spent on project:

Measurement : Please list number of monitoring trips, bags of trash collected, letters written, trees planted, events held, etc. See code list at right.

Location Description: Please provide a detailed location for your activity. (Example: 100 yds. upstream from Hwy. 63 bridge.) Include township, range, and section if possible. A good source for maps can be found at www.digital-topo-maps.com.

Project Description: Please include as much information as you can about your activity. Include facts about the project not covered above. (Example: "Held 4th Annual litter pickup and picnic at Dry Fork Creek.")

Stream Team Activity Code List

Activity	Code	Measurement
Litter pickup	LPU	Number of litter bags
Water quality monitoring	WQM	Number of trips
Pre-activity planning	PLN	Number of events
Stream Team meeting	MTG	Number of attendees
Stream workshop attended	WKS	Number of attendees
Education project	EDU	Number of events
Letter written on stream issue	LET	Number of letters
Article written for newspaper, etc.	ART	Number of articles
Media contact/interview	MED	Number of interviews
Tree planting	PLT	Number of trees
Presentation to groups	PRE	Number of presentations
ST display at school, fair, etc.	DIS	Number of events
ST Inventory Guide submitted	INV	Number of inventories
GPS Reading (New Activity!)	TRP	Number of trips
Zebra mussel monitoring form	ZEB	Number of trips
Storm drain stenciling	SDS	Number of drains stenciled
Monofilament recycling project	MRP	Weight of line recycled
Streambank stabilization project	SSP	Number of events
Habitat improvement	HAI	Number of projects
Advocacy on stream issue	ADV	Number of hours
Photo Point Monitoring	PPM	Number of photos
Greenway development	GRE	Number of projects
Recruited new Team/members	REC	Number of people recruited
Stream Team mentoring	MEN	Team mentored & hours
Stream Access Maintenance	SAM	Number of litter bags/events
Adopt-An-Access project	AAA	Number of litter bags/hours
Forestkeepers monitoring	FOR	Number of events
ST Association activity	ASC	Number of hours
Award received	AWA	Number of awards
Grant applied/received	GRT	Number of projects
Watershed mapping	WAT	Number of trips
Assisted MDC fish stocking	FIS	Number of events
Other: please describe	OTH	Number of Projects

Dreaded Introductions!

- Name
- Rank
- Serial Number
- Adopted Stream?